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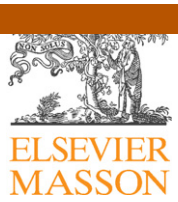

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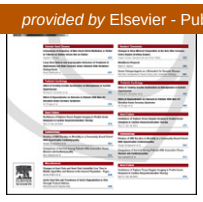

IMAGE

Percutaneous closure of a left superior vena cava draining directly into the left atrium in a child

Fermeture percutanée d'une veine cave supérieure gauche se drainant directement dans l'oreillette gauche chez un enfant

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A 1-month-old boy was referred to our unit for discrete cyanosis during breastfeeding. There was no familial history of congenital heart disease. He was born at 34 weeks of gestation after a normal pregnancy. On examination, cardiac auscultation was normal and oxygen saturation was 97%. There were no signs of cardiac insufficiency. Two-dimensional transthoracic echocardiography revealed a left superior vena cava (LSVC) draining into the roof of the left atrium (Fig. 1A and Supplementary data, Video 1). There was a persistent foramen ovale with a discrete left-to-right shunt. The coronary sinus was not dilated. A computed tomography (CT) scan confirmed the abnormal systemic venal return (Fig. 1 B and C). The coronary sinus did not communicate with the LSVC and its drainage ostium measured 2.3 mm in diameter. The LSVC and right superior vena cava were not connected by any left innominate vein. No additional cardiac anomaly was seen. At 13 months of age, the patient was dyspnoeic and sweated at effort. The saturation rate was 91% at rest. Using a 2/10 mm plug, the percutaneous closure of the LSVC was successful (Fig. 2A). The device was introduced via the left jugular vein. Both echocardiography and CT scan did not reveal any persistent shunt after the procedure (Fig. 2B and C). The patient recovered a normal peripheral saturation without any dyspnoea.

Abbreviations: CT, computed tomography; LSVC, left superior vena cava.

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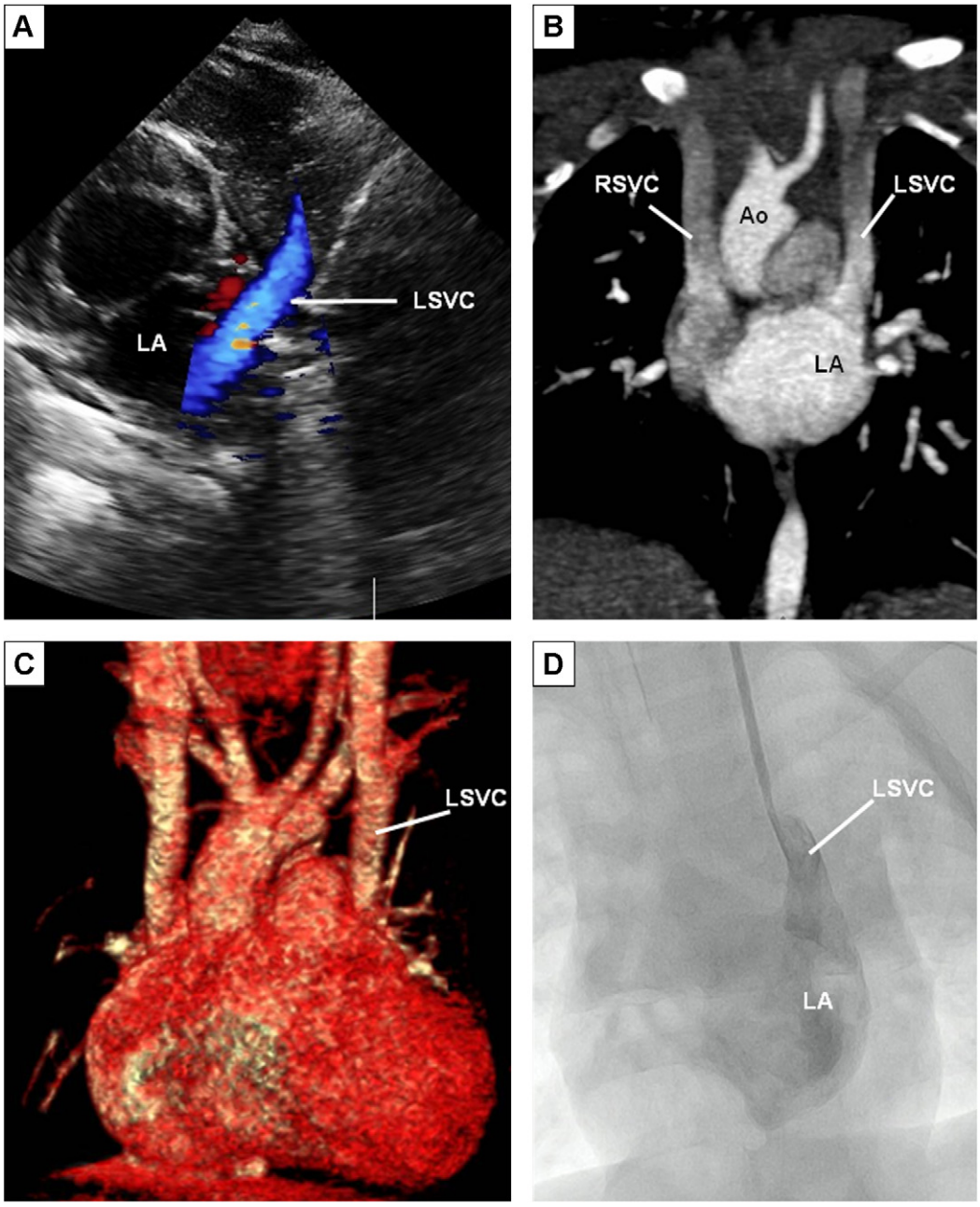

Figure 1. A. Two-dimensional transthoracic echocardiographic view showing a persistent left superior vena cava draining into the left atrium. B. Computed tomography (CT) scan showing two equilibrated superior venae cavae without left innominate vein. C. Three-dimensional CT scan reconstruction showing the absence of communication between the two superior venae cavae. D. Angiography confirming the direct connection of the left superior vena cava (LSVC) to the roof of the left atrium without any communication with the coronary sinus. Ao: aorta; LA: left atrium; RSVC: right superior vena cava.

An LSVC, which is believed to be the persistence of the left superior cardinal vein, is the most common anomaly of the thoracic systemic venous system, occurring in approximately 0.3% to 0.5% of the general population and usually draining into a dilated coronary sinus. Uncommonly, the coronary sinus is totally or partially unroofed, thus creating an atrial left-to-right shunt. A very rare anomaly is the persistence of an LSVC directly connected to the left atrium, with a separated normal coronary sinus. According to the embryology, this particular anatomy may be due to a persistent connection between the left superior cardinal vein and the roof of the left atrium but, unlike unroofed coronary sinus, with normal development of the distal coronary sinus. Secondarily, LSVC may lose its connection with the coronary sinus. In order to correct cyanosis and to prevent brain complications due to the right-to-left shunt, it is recommended that the LSVC is closed in this context. This unusual case shows that, while

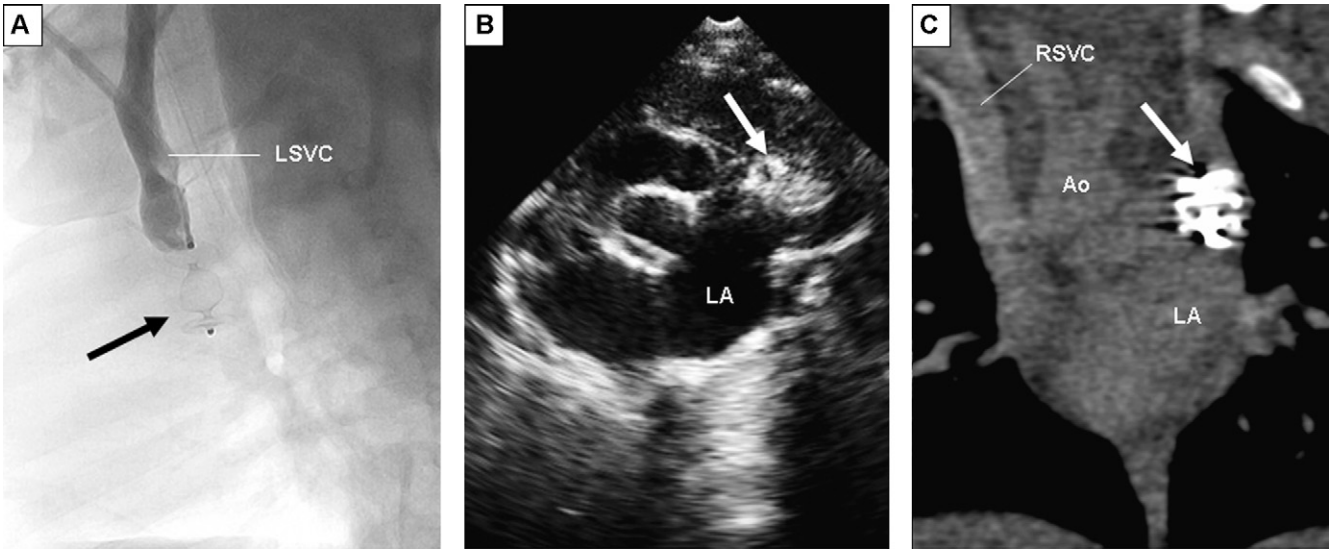

Figure 2. A. Angiography showing the plug (black arrow) with a complete occlusion of the left superior vena cava. B. Two-dimensional transthoracic echocardiographic view showing the device (white arrow). C. Computed tomography scan view showing the device (white arrow) placed at the junction of the left superior vena cava with the left atrium. Ao: aorta; LA: left atrium; LSVC: left superior vena cava; RSVC: right superior vena cava.

being less invasive, percutaneous closure is as efficient as surgery.

Disclosure of interest

The authors declare that they have no conflicts of interest concerning this article.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at doi:10.1016/j.acvd.2011.03.093.